BANGALORE WATER SUPPLY
AND SEWRAGE BOARD
CAUVERY BHAVAN, KEMPEGOWDA ROAD
BANGALORE - 560 009

Telephone: 91-80-22945106 Fax: 91-80-22945106

Through E-Procurement

TENDER FOR THE WORK OF

DESIGN, CONSTRUCTION, AND COMMISSIONING OF **20 MLD STP BASED ON INTEGRATED FIXED FILM ACTIVATED SLUDGE (IFAS-PROCESS) WITH BNR, TERTIARY TREATMENT AND ODOUR CONTROL UNITS AT KADUGODI** INCLUDING 7 YEARS OF OPERATION & MAINTENANCE (TURNKEY CONTRACT)

VOLUME 3 of 4

(DRAWINGS)

OCTOBER – 2025

Office of the *Chief Engineer (WWM-E)/CE (UWP)*
BANGALORE WATER SUPPLY & SEWERAGE BOARD
5th Floor, Cauvery Bhavan,
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TITLE: PROCESS FLOW DIAGRAM

DWG NO TCE.13052A-CV-3008-SL-30000C

RAW SEWAGE

OCU-1

INLET CHAMBER

TRASH SCREEN

COARSE SCREEN

TROLLY

SCREENED MATERIAL FOR DISPOSAL

TROLLY

SCREENED MATERIAL FOR DISPOSAL

WET WELL

OVERFLOW BYPASS

BYPASS

OCU-2

SCREENED MATERIAL FOR DISPOSAL

TROLLY

INLET CHAMBER

FINE SCREENS CHANNEL

GRIT DISPOSAL

TROLLY

GRIT WASHING

VORTEX GRIT CHAMBER

BYPASS

TO SCUM PIT

PARSHALL FLUME

IFAS MEDIA

MLR

DE-AERATION ZONE

ALUM DOSING

ANAEROBIC ZONES

ANOXIC ZONES

AEROBIC ZONES

PROCESS AIR

IFAS REACTOR

SECONDARY CLARIFIER

DISC FILTER BYPASS

DISC FILTER

BACK WASH

BACK WASH RETURN

CHLORINE

CHLORINE CONTACT TANK

OUTFALL STRUCTURE

FINAL DISPOSAL

TREATED WATER STORAGE

TO DISC FILTER BACKWASH

TO PLANT UTILITIES

FOR TANKER FILLING

SEPTIC TANK

WASTE WATER FROM ADMIN BUILDING

OCU-3

RAS

WAS

SCUM PIT

POLYMER DOSING

CENTRIFUGE FEED SUMP

CENTRIFUGE

CAKE HOPPER AND CONVEYOR

TROLLY

SLUDGE FOR DISPOSAL

DRAIN

PLAN DRAIN SUMP

DRAIN FROM ALL PROCESS BUILDINGS

FROM PUBLIC WATER SUPPLY

BREAK TAKE

OVER HEAD TANK

FOR TENDER PURPOSE ONLY

	SIGN.											
	INITIALS											
	REVISIONS											
	SIGN.											
	INITIALS											
	REVISIONS											
P0	SIGN.											
	INITIALS											
ISSUE		DRN	DSN	CHD	CV	EL	IC	ME	PE/PM	APPD	DATE	
					CLEARED							

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 20 MLD CAPACITY STP AT KADUGODI

DWG NAME: PROCESS FLOW DIAGRAM

TATA CONSULTING ENGINEERS LIMITED

SCALE : NTS | DWG NO. TCE.13052A-CV-3008-SL-30000C | ISSUE P0

DC & DISC : BLR-CV

TCE FORM NO. 091 R1

SIZE-A1

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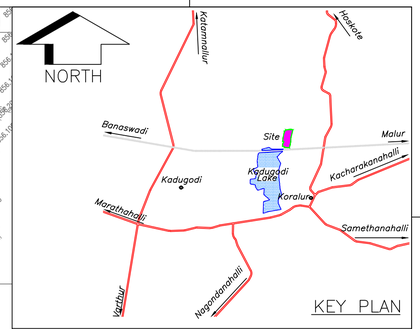
FILE NAME : PFD (20 MLD Kadugodi).dwg

FILE NAME: F-091-Rev-R1.dwg



LEGENDS:

- RAW SEWAGE PIPE
- SLUDGE PIPE
- SUPERNATANT PIPE
- TREATED WATER
- BYPASS LINE
- SCUM PIPE
- PROPOSED ROAD
- EXISTING ROAD
- (10) PROPOSED STP UNITS
- PROPOSED COMPOUND WALL
- PROPOSED CHAIN LINK FENCING

ASPHALT ROAD, CONCRETE ROAD.
DRAIN, BUILDING/SHEET HOUSE.
COMPOUND WALL WITH GATE, FENCE.
POWER POLE & LINE, TRANSFORMER.
ORDINARY, CAMBER, MANHOLE, LAMP POST.
BOUNDARY & POINTS. B1 B2
CONTOUR WITH CONT RL, SPOT LEVELS. 872.25 872.379
CHAMBER INVERT LVL, DRAIN CENTER LVL. MANHOLE INVERT LVL, BENCH MARKS. 869.651 871.992 870.454 SBM1

NOTES:

1. ALL LEVELS ARE IN METERS,UNLESS OTHER WISE MENTIONED.
2. ALL LEVELS ARE WITH REFERENCE TO THE GTS BENCH MARK ENGRAVED ON CENTER OF 2ND STONES ON EAST SIDE OF QUEEN VICTORIA'S STATUE IN CUBBON PARK,BANGALORE.ITS VALUE IS 912.266M.
3. ALL THE CO-ORDINATES ARE BASED ON UTM WGS-84.
4. ALL THE PROCESS AND NON-PROCESS BUILDING DIMENSIONS SHOWN ARE MINIMUM AND HEIGHT OF THE BUILDING SHALL BE FROM FINISHED FLOOR LEVEL TO THE BOTTOM OF ROOF BEAM.
5. FINISHED FLOOR LEVEL OF ALL PROCESS AND NON PROCESS BUILDING SHALL BE ATLEAST 500MM ABOVE THE FINISHED GROUND LEVEL.
6. FINISHED GROUND LEVEL (FGL) OF THE STP SHALL BE MINIMUM 500MM ABOVE THE HFL.
7. ALL THE BUILDING DIMENSIONS (OR AREA WHEN CALCULATED) SHOWN ARE MINIMUM. HOWEVER, CONTRACTOR MAY UPSIZE THESE DIMENSIONS (OR AREA WHEN CALCULATED) BASED ON HIS DESIGN TO MEET THE SPECIFIED TENDER REQUIREMENTS.
8. CONTRACTOR HAS TO PROPOSE A PILE FOUNDATION FOR ALL PROCESS UNITS INCLUDING FOR ALL TYPES OF BUILDINGS AS A PART OF THE FOUNDATION DESIGN OF THIS STP
9. TOTAL LENGTH OF PROPOSED 5m WIDE ROAD = 420m
10. TOTAL LENGTH OF PROPOSED 8m WIDE ROAD = 200m
11. TOTAL LENGTH OF PROPOSED RCC PRECAST COMPOUND WALL = 1255m
12. TOTAL LENGTH OF PROPOSED CHAIN LINK FENCING = 385m

AREA STATEMENT

Area in Sqmt	Area in Acre
78803.540	19.472

HFL :857.80M

KADUGODI 50 MLD TSPS COMPONENT LIST

SI NO.	COMPONENT NAME	NO. OF UNITS	SIZE IN METERS L	W	LD*/H	DIA	Free board (m)
	TERMINAL SEWAGE PUMPING STATION (TSPS)						
01	TSPS INLET CHAMBER	1	3.60	6.30	1.20	–	0.75m Above FGL
02	TRASH SCREEN & COARSE SCREEN CHANNEL	3	10.00	1.70	1.00	–	0.75m Above FGL
03	COARSE SCREEN EFFLUENT CHANNEL	1	1.50	6.30	0.90	–	0.75m Above FGL
04	WET WELL	1	–	–	2.20	15.10	0.75m Above FGL
05	PUMPING HOUSE (ABOVE WET WELL)	1	–	–	5.50	15.10	–
06	VALVE CHAMBER	2	11.00	2.50	2.00	–	–

KADUGODI 20MLD STP COMPONENT LIST

SI NO.	COMPONENT NAME	NO. OF UNITS	SIZE IN METERS L	W	LD*/H	DIA	Free board (m)
	SEWAGE TREATMENT PLANT (STP)						
07	STP INLET CHAMBER	1	2.30	4.80	1.50	–	0.50
08	FINE SCREEN CHANNEL	2	7.00	1.80	1.10	–	0.50
09	FINE SCREEN EFFLUENT CHANNEL	1	1.50	4.80	1.00	–	0.50
10	GRIT CHAMBER	2	–	–	1.50	3.80	0.50
11	PARSHALL FLUME CHANNEL	1	15.00	1.50	0.70	–	0.50
12	IFAS FLOW DISTRIBUTION BOX	1	3.00	3.00	1.80	–	0.50
13	ANAEROBIC ZONE	2	5.90	18.00	6.00	–	0.60
14	ANOXIC ZONE	2	19.50	18.00	6.00	–	0.60
15	AEROBIC ZONE	2	40.80	18.00	6.00	–	0.60
16	DE-AERATION ZONE	2	12.30	3.00	5.70	–	0.60
17	AERATION BASIN EFFLUENT CHANNEL	1	33.00	1.50	0.60	–	0.50
18	SECONDARY CLARIFIER FLOW DISTRIBUTION BOX	1	4.20	3.00	1.80	–	0.50
19	SECONDARY CLARIFIERS	2	–	–	3.70	25.50	0.50
20	DISC FILTER INFLUENT AND EFFLUENT CHANNEL	1	5.40	1.20	0.70	–	0.50
21	DISC FILTER	1	6.00	3.00	1.50	–	0.50
22	DISC FILTER BYPASS CHANNEL	1	6.00	1.20	0.70	–	0.50
23	DISC FILTER BUILDING(ABOVE DISK FILTER)	1	6.00	5.40	5.50	–	–
24	CCT FLOW DISTRIBUTION BOX	1	3.00	3.00	1.80	–	0.50
25	CHLORINE CONTACT TANK	2	25.4	6.20	1.90	–	0.50
26	CCT EFFLUENT CHANNEL	1	13.00	1.20	0.70	–	0.50
27	SECONDARY PUMP HOUSE	1	12.00	8.00	5.50	–	–
28	CENTRIFUGE FEED SUMP	1	8.00	8.50	3.50	–	1.00
29	CENTRIFUGE FEED PUMP HOUSE	1	8.00	9.00	5.50	–	–
30	CENTRIFUGE BUILDING(G+1)	1	8.00	9.00	5.50	–	–
31	BLOWER BUILDING(INCLUDING ELECTRICAL PANEL)	1	13.00	13.00	9.00	–	–
32	CHEMICAL BUILDING	1	11.00	10.00	5.50	–	–
33	CHLORINATION BUILDING	1	21.00	9.00	5.50	–	–
34	SECONDARY SCUM PIT	1	–	–	1.50	5.50	1.50
35	PLANT DRAIN SUMP	1	–	–	1.50	5.50	2.00
36	TREATED WATER STORAGE	1	5.50	4.00	3.00	–	1.00
37	TRANSFORMER YARD	1	12.00	7.00	–	–	–
38	ELECTRICAL SUB STATION(TSPS/STP)	1	20.00	10.00	5.50	–	–
39	PLANT DG ROOM	1	12.00	10.00	6.50	–	–
40	ADMIN BUILDING INLUDES PLC SCADA,LABORATORY(G+1)	1	10.00	10.00	4.50	–	–
41	PARKING SHED	1	15.00	6.00	4.50	–	–
42	GUARD ROOM(SECURITY ROOM)	1	3.00	3.00	3.00	–	–
43	OUTFALL CHAMBER	1	3.00	3.00	1.50	–	–
44	OVERFLOW CHAMBER	2	2.00	2.00	1.50	–	0.50
45	ODOUR CONTROL ROOM(OCU 1) NEAR TSPS	1	8.00	5.00	6.00	–	–
46	OCU 2 (Near Preliminary treatment units)	1	6.00	4.00	6.00	–	–
47	OCU 3 (Near Sludge handling units)	1	6.00	4.00	6.00	–	–

LIST OF POINTS

POINTS	EASTING	NORTHING	RL
SBM7	801209.135	1438376.168	858.233
SBM8	801238.883	1438373.216	858.243
BASE1	801217.466	1438374.967	860.209

LIST OF BOUNDARY DETAILS

BOUNDARY POINTS	CO-ORDINATES EASTING	NORTHING	DISTANCE INMETRES
B2	801201.801	1438347.003	116.38
B3	801199.184	1438361.095	14.33
B4	801154.878	1438373.299	18.82
B5	801178.684	1438486.490	118.91
B6	801153.854	1438505.358	36.635
B7	801194.473	1438741.524	240.054
B8	801225.464	1438772.366	54.266
B9	801402.660	1438773.954	181.015
B10	801353.924	1438585.997	194.17
B11	801346.939	1438473.623	112.59
B1	801317.897	1438338.890	137.867

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CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 20 MLD CAPACITY STP AT KADUGODI

DWG NAME: OVERALL PLANT LAYOUT WITH CONTOURS

TATA CONSULTING ENGINEERS LIMITED

SCALE	DWG NO.	ISSUE
: NTS	TCE.13052A-CV-3008-SL-30300	P0
DC & DISC: BLR-CV		SIZE-A1

FILE NAME : LAYOUT (20 MLD Kadugodi).dwg

FILE NAME: F-091-Rev-R1.dwg

TCE FORM NO. 091 R1

TITLE: OVERALL PLANT LAYOUT WITH CONTOURS

DWG NO TCE.13052A-CV-3008-SL-30300

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 20MLD STP, KADUGODI

DWG NO TCE.13052A-EL-4001-AU-40031

LEGENDS:-

RELAYING

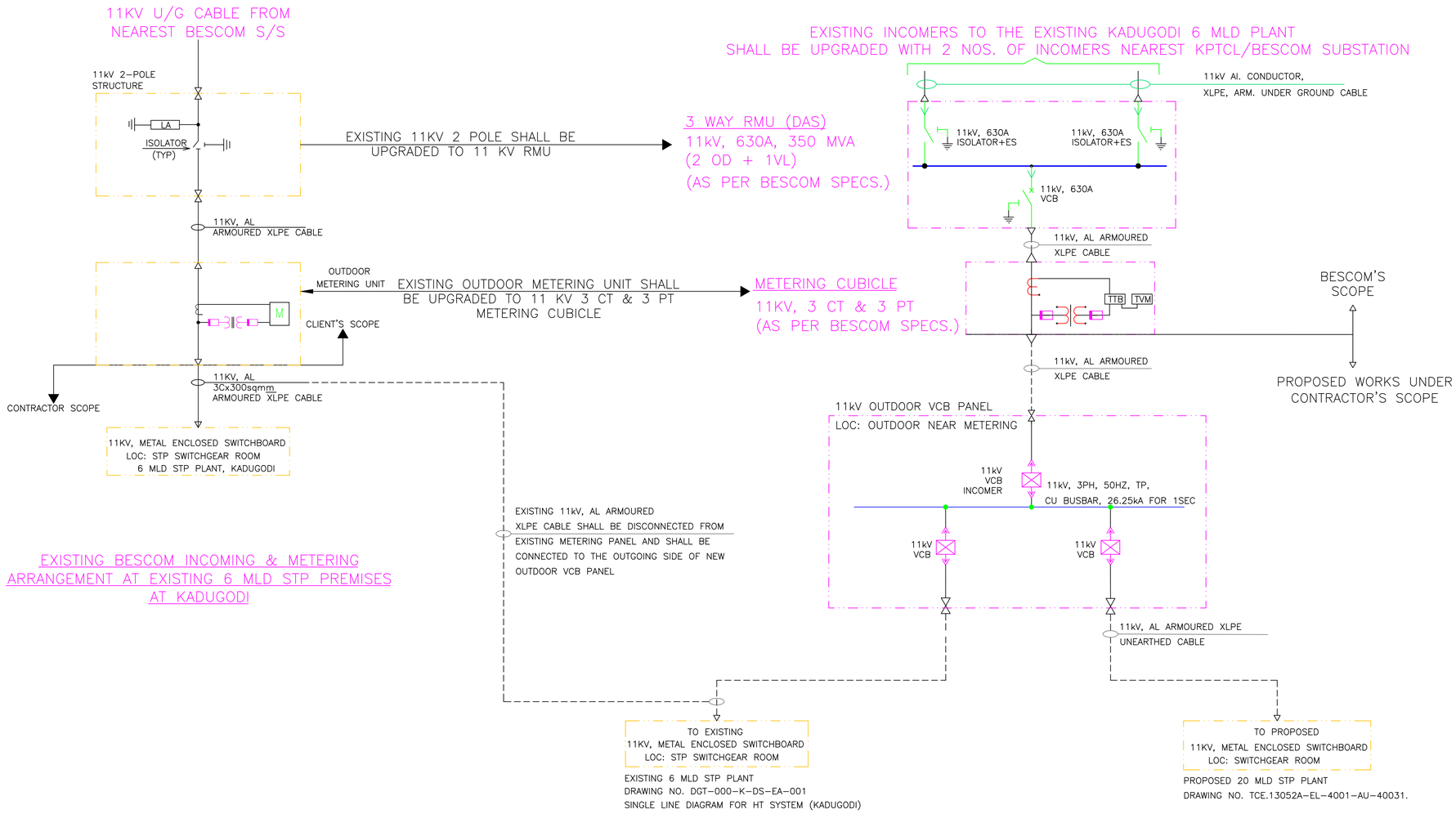
50	INSTANTANEOUS PHASE OVER CURRENT RELAY SUFFIX N- GROUND
51	INVERSE DEFINITE MINIMUM TIME OVER CURRENT RELAY SUFFIX N- GROUND, SUFFIX NS-STANDBY EARTH
95	TRIP CIRCUIT SUPERVISION RELAY
94	ANTI-PUMPING RELAY
27	UNDER VOLTAGE RELAY
86	LOCKOUT RELAY (HAND RESET)
OSR	OIL SURGE RELAY
PRV	PRESSURE RELEASE VALVE
50BF	BREAKER FAIL
46	REVERSE PHASE/UNBALANCE
24	VOLTS PER HERTZ RELAY
49	TRANSFORMER THERMAL RELAY
64R	RESTRICTED EARTH FAULT PROTECTION RELAY

- 3-PH DISTRIBUTION TRANSFORMER
- CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- CABLE TERMINATION
- 415V DRAW OUT TYPE AIR CIRCUIT BREAKER
- 11KV DRAW OUT TYPE VACUUM CIRCUIT BREAKER
- 415V MOULDED CASE CIRCUIT BREAKER
- 415V MINIATURE CIRCUIT BREAKER
- BREAKER CONTROL SWITCH
- INDICATING LAMP

- M — MOTOR
- STAR-DELTA STARTERS WITH SINGLE PHASE PREVENTOR AND MPR
- DIRECT ONLINE STARTERS WITH SINGLE PHASE PREVENTOR AND MPR
- G — DG SET WITH AMF CONTROL PANEL
- TCH — TRIP CIRCUIT HEALTHY INDICATION (WHITE LED)
- SCI — SPRING CHARGED INDICATION (BLUE LED)
- BON — BREAKER ON INDICATION (RED LED)
- BOFF — BREAKER OFF INDICATION (GREEN LED)
- TC — TRIPPED ON FAULT INDICATION (AMBER LED)
- DCF — DC SUPPLY FAIL INDICATION (AMBER LED)
- BS — BREAKER IN SERVICE POSITION (RED LED)
- BT — BREAKER IN TEST POSITION (CLEAR LED)
- ACF — AC SUPPLY FAIL INDICATION (AMBER LED)
- ON — ON INDICATION (RED LED)

- OFF — OFF INDICATION (GREEN LED)
- TRIP — TRIP INDICATION (AMBER LED)
- R — R-PHASE INDICATION LAMP (RED LED)
- Y — Y-PHASE INDICATION LAMP (YELLOW LED)
- B — B-PHASE INDICATION LAMP (BLUE LED)
- LOCAL/OFF/REMOTE SELECTOR SWITCH
- SA — SURGE ARRESTER
- ASS+DA — DIGITAL AMMETER WITH BUILT IN SELECTOR SWITCH
- VSS+DV — DIGITAL VOLTMETER WITH BUILT IN SELECTOR SWITCH
- 415V, FIXED TYPE MOTOR PROTECTION CIRCUIT BREAKER (MPCB)
- ICP — INSTRUMENTATION CONTROL PANEL
- N.RELAY — NUMERICAL RELAY
- MFM — MULTI FUNCTION METER WITH RS485 COMMUNICATION (AMMETER, VOLTMETER, PF, FREQUENCY)
- PLC — PROGRAMMABEL LOGIC CONTROLLER

- MPR — COMPREHENSIVE MOTOR PROTECTION RELAY
- M — METERING UNIT
- CAPACITOR BANK
- LCSP — LOCAL CONTROL STARTER PANEL
- TTB(CT SHORT LINK)
- SS — SOFT STARTER
- ISO — LOCAL ISOLATOR SWITCH
- RC — READY TO CLOSE (CLEAR LED)
- LCP — LOCAL CONTROL PANEL
- CONTROL TRANSFORMER
- TR
- I/L — INTER LOCK


11KV U/G CABLE FROM NEAREST BESCOM S/S
11kV 2-POLE STRUCTURE
LA
ISOLATOR (TYP)
EXISTING 11KV 2 POLE SHALL BE UPGRADED TO 11 KV RMU
3 WAY RMU (DAS)
11kV, 630A, 350 MVA
(2 OD + 1VL)
(AS PER BESCOM SPECS.)
EXISTING INCOMERS TO THE EXISTING KADUGODI 6 MLD PLANT SHALL BE UPGRADED WITH 2 NOS. OF INCOMERS NEAREST KPTCL/BESCOM SUBSTATION
11kV Al. CONDUCTOR, XLPE, ARM. UNDER GROUND CABLE
11kV, 630A ISOLATOR+ES
11kV, 630A ISOLATOR+ES
11kV, 630A VCB
11KV, AL ARMOURED XLPE CABLE
OUTDOOR METERING UNIT
EXISTING OUTDOOR METERING UNIT SHALL BE UPGRADED TO 11 KV 3 CT & 3 PT METERING CUBICLE
METERING CUBICLE
11KV, 3 CT & 3 PT
(AS PER BESCOM SPECS.)
M
CLIENT'S SCOPE
TTB
TVM
BESCOM'S SCOPE
PROPOSED WORKS UNDER CONTRACTOR'S SCOPE
CONTRACTOR SCOPE
11KV, AL 3Cx300sqmm ARMOURED XLPE CABLE
11KV, AL ARMOURED XLPE CABLE
11kV OUTDOOR VCB PANEL
LOC: OUTDOOR NEAR METERING
11KV, METAL ENCLOSED SWITCHBOARD
LOC: STP SWITCHGEAR ROOM
6 MLD STP PLANT, KADUGODI
11kV VCB INCOMER
11kV, 3PH, 50HZ, TP, CU BUSBAR, 26.25kA FOR 1SEC
11kV VCB
11kV VCB
EXISTING 11kV, AL ARMOURED XLPE CABLE SHALL BE DISCONNECTED FROM EXISTING METERING PANEL AND SHALL BE CONNECTED TO THE OUTGOING SIDE OF NEW OUTDOOR VCB PANEL
11kV, AL ARMOURED XLPE UNEARTHED CABLE
TO EXISTING 11KV, METAL ENCLOSED SWITCHBOARD LOC: STP SWITCHGEAR ROOM
EXISTING 6 MLD STP PLANT
DRAWING NO. DGT-000-K-DS-EA-001
SINGLE LINE DIAGRAM FOR HT SYSTEM (KADUGODI)
TO PROPOSED 11KV, METAL ENCLOSED SWITCHBOARD LOC: SWITCHGEAR ROOM
PROPOSED 20 MLD STP PLANT
DRAWING NO. TCE.13052A-EL-4001-AU-40031.

EXISTING BESCOM INCOMING & METERING ARRANGEMENT AT EXISTING 6 MLD STP PREMISES AT KADUGODI

BESCOM INCOMING & METERING ARRANGEMENT FOR PROPOSED 20 MLD STP & EXISTING 6 MLD STP

NOTES:

1. TRIP COIL CIRCUITS OF ALL CIRCUIT BREAKERS SHALL BE PROVIDED WITH TRIP SUPERVISION RELAY TO SUPERVISE THE CIRCUIT IN BOTH OPEN AND CLOSED POSITION OF CIRCUIT BREAKERS.
2. ALL RELAYS USED IN 11kV SWITCHGEAR SHALL BE NUMERICAL TYPE.
3. AMMETERS IN MOTOR FEEDERS SHALL BE PROVIDED WITH SUPPRESSED SCALE UP TO 6 TIMES FULL LOAD CURRENT FOR INDICATION STARTING CURRENT.
4. ACB's SHALL BE PROVIDED WITH MICROPROCESSOR RELEASES FOR ADJUSTABLE OVERLOAD SHORT CIRCUIT, UNDER VOLTAGE AND EARTH FAULT FOR LT BREAKER. VCB'S SHALL BE PROVIDED WITH SHUNT TRIP COILS RATED WITH 110V DC FOR HT BREAKER.
5. MCCB's SHALL BE PROVIDED WITH ELECTRONIC RELEASES FOR ADJUSTABLE OVERLOAD, SHORT CIRCUIT AND EARTH FAULT.
6. ALL PANEL WIRING SHALL BE WITH 1100 VOLTS GRADE PVC INSULATED 1.5 Sqmm STRANDED COPPER WIRE FOR CONTROL WIRING & 2.5 Sqmm FOR CT SECONDARY WIRING.
7. ALL CT'S SHALL BE OF 5A SECONDARY.
8. ALL CONTACTOR/TIMERS etc., SHALL BE RAIL MOUNTED.
9. MINIMUM CONTACTOR RATING SHALL BE 16A.
10. CONTROL SUPPLY SHALL BE 240V AC TAPPED BETWEEN PHASE AND NEUTRAL FEEDERS MODULES.
11. MPCB SHALL BE WITH IN BUILT SINGLE PHASING PREVENTER.
12. ALL CONTACTORS SHALL BE OF AC 3 DUTY.
13. WIDTH OF FEEDER COLOUMN SHALL BE MINI 500 mm CABLE ALLEY SHALL BE 300mm MINI.
14. ALL ACB, MCCB, CONTACTORS, MPCB, & MPR SHALL BE OF TYPE-2 CO-ORDINATION.
15. LCP SHALL BE AS INDICATED IN P&ID.
16. CT RATIO SHALL BE 20% MORE THAN THE FLC 0.85PF & 0.9 EFFICIENCY.
17. CABLE COMPARTMENT SHALL HAVE LED LAMP INTERLOCKED WITH DOOR.
18. ALL INDICATION LAMP SHALL HAVE LED CLUSTER TYPE.
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(C) IN CASE OF POWER FAILURE, THE DG INCOMER, BUS COUPLER SHALL BE IN CLOSED POSITION. BOTH THE TRANSFORMER INCOMER SHALL BE SWITCHED OFF BY ACTIVATION OF UNDER VOLTAGE RELAY OF THE GRID INCOMER.

21. MOTOR FEEDER <5.5kW WILL HAVE DIRECT CONNECTED AMMETER IN Y PHASE, MOTORS >5.5kW UPTO 15kW WILL BE PROVIDED WITH 1 CT AND AMMETER AND MOTOR >15kW AND ABOVE WILL BE PROVIDED WITH 3 CTS AND AMMETER.
22. NECESSARY INTERLOCK TO SPACE HEATER WITH MOTORS TO BE PROVIDED.
23. ALL MCB SHALL HAVE KW = 100% Ics.
24. ALL MCCB CONNECTED TO MOTOR SHALL BE RATED TO MOTOR DUTY.
25. ALL ACB SHALL HAVE Icu = Ics = Icw.
26. THE 415V SIDE OF THE TRANSFORMER IS PROVIDED WITH NON SEGREGATED ALUMINUM BUS DUCT IF THE TRANSFORMER RATING IS GREATER THAN OR EQUAL TO 1000KVA. FOR THE TRANSFORMER RATING IS LESS THAN 1000KVA XLPE AL AROMUED CABLE SHALL BE PROVIDED ON 415V SIDE.
27. CABLE SIZES LESS THAN OR EQUAL TO 6 Sqmm SHALL BE PROVIDED WITH COPPER CONDUCTORS AND AL CONDUCTORS TO BE USED FOR CABLE SIZES ABOVE 6 Sqmm.
28. CAPACITOR BANK WITH APFC SHALL BE PROVIDED WITH INTERLOCK SUCH THAT PANELS ARE FED BY DG SET, CAPACITOR BANK SHALL BE DISCONNECTED.
29. 20% SPARE FEEDERS WITH MINI OF 1 SPARE FEEDER FOR EACH RATING OF THE OUTGOING FEEDERS SHALL BE PROVIDED IN LT PANELS (PCC/MCC).
30. PORTABLE TYPE STARTER WILL BE PROVIDED FOR GATES.

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					CLEARED								

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 20 MLD CAPACITY STP AT KADUGODI

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 01 OF 05

TATA CONSULTING ENGINEERS LIMITED
MUMBAI

SCALE : NTS
DC & DISC: BLR-EL
DWG NO. TCE.13052A-EL-4001-AU-40031
ISSUE P0

SIZE-A1

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FILE NAME : SLD (20 MLD Kadugodi).dwg

FILE NAME: F-091-Rev-R1.dwg

TCE FORM NO. 091 R1

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 20MLD STP, KADUGODI

DWG NO TCE.13052A-EL-4001-AU-40032

FROM 11KV OUTDOOR VCB PANEL
DWG. NO. TCE.13052A-EL-4001-AU-40031

11kV, AL ARMOURED XLPE UNEARTHED CABLE

11kV METAL ENCLOSED SWITCHBOARD
LOC: 11kV HT ROOM

TO TRAFO OUTGOING
VSS+DV
R Y B
MCB
BUS PT
11kV/110V/110V
CL.-0.5 (METERING)
CL.-3P (PROTECTION)

Line PT-1
11kV/110V/110V
CL.-0.5 (METERING)
CL.-3P (PROTECTION)
SA
MCB
VSS+DV
R Y B
PROTECTION CT
CL:5P20
R 50,50N,51,51N,27,50BF,95,94
NUMERICAL RELAY
PLC
METERING CT
CL:1
MFM ASS+DA
11kV
VCB
INCOMER
86

(ON I/C FEEDER)
BON BOFF T TCH SC
DCF RC BS BT ACF

11kV, 3PH, 50HZ, TP, CU BUSBAR, 26.25kA FOR 1SEC

(ON O/G FEEDER)
95 94 86
BON BOFF T TCH SC
DCF RC BS BT ACF

11kV VCB
86
50,50N,51,51N,49,24,50BF
94,WTI,OTI,BR,OSR,PRV
51NS,46
P1
METERING CT
CL:1
MFM
PROTECTION CT
CL:5P20
R 50/51 50N
P2
SA
N.RELAY PLC
PLC
TRANSFORMER
ANNUNCIATION
(TYP)

11kV, AL ARMOURED XLPE
UNEARTHED CABLE
MARSHELLING
BOX(TYP)

TR-1, 11kV/433V, ONAN, Z=%
AS PER IS:1180, DYN11,
OUTDOOR PLINTH MOUNTED WITH
WTI, OTI, BR, MOG, OSR PRV
WITH TAP CHANGER INDICATION
WITH +5% TO -15% TAPS IN
STEPS OF 2.5%
R 51NS
R 64R
NON - SEGREGATED TPN
ALUMINIUM BUSDUCT

TR-2, 11kV/433V, ONAN, Z=%
AS PER IS:1180, DYN11,
OUTDOOR PLINTH MOUNTED WITH
WTI, OTI, BR, MOG, OSR PRV
WITH TAP CHANGER INDICATION
WITH +5% TO -15% TAPS IN
STEPS OF 2.5%
R 51NS
R 64R
NON - SEGREGATED TPN
ALUMINIUM BUSDUCT

NON - SEGREGATED TPN
ALUMINIUM BUSDUCT

415V PCC
LOC: SUB-STATION BUILDING

ON MCCB
ON OFF TRIP
ON ACB
BON BOFF
TCH SC T RC

PROTECTION CT
CL:5P20
MCB R Y B
METERING CT
CL.-1.0
MFM
TO PLC (RS485)
EDO,ACB,TPN WITH
MICROPROCESSOR RELEASE
FOR O/C, E/F, UV & S/C
INCOMER-1
NC

BUS-1
R Y B
MCB
I/L
NO
BUS-2
INCOMER-2
EDO,ACB,TPN WITH
MICROPROCESSOR RELEASE
FOR O/C, E/F, UV & S/C

DG INCOMER
NO
EDO,ACB,TPN WITH
MICROPROCESSOR RELEASE
FOR O/C, E/F, UV & S/C

415V, 3PH, 50HZ, TPN, CU BUSBAR 50KA FOR 1SEC

FUSE
415/230V AC
TR
MCB DP
TPN ACB
TPN MCCB
BUSCOUPLER
SAME AS
INCOMER
KVAr
APFCR

1.1kV XLPE CU/AL
ARMOURED CABLE

FOR FEEDERS CONTROL SUPPLY
SPARE
RTCC PANEL
BATTERY CHARGER
AIR BLOWER MCC
EFDB SUBSTATION BLDG
EFDB DG ROOM
SPARE 2 Nos
MLDB
CAPACITOR BANK WITH APFC
CAPACITOR BANK WITH APFC
TSPS MCC
SPARE
HEADWORKS MCC
CENTRIFUGE MCC
RTCC PANEL
SPARE
RAS MCC
CHLORINE MCC
FOR FEEDERS CONTROL SUPPLY

DG ROOM
415V DG SET#01 WITH AMF CONTROL PANEL
415V DG SET#02 WITH AMF CONTROL PANEL
G
1.1kV XLPE AL ARMOURED CABLE
TPN
ACB

DG PCC
LOC: SUB-STATION BUILDING

LEGENDS:-

(R) RELAYING

50	INSTANTANEOUS PHASE OVER CURRENT RELAY SUFFIX N- GROUND
51	INVERSE DEFINITE MINIMUM TIME OVER CURRENT RELAY SUFFIX N- GROUND, SUFFIX NS-STANDBY EARTH
95	TRIP CIRCUIT SUPERVISION RELAY
94	ANTI-PUMPING RELAY
27	UNDER VOLTAGE RELAY
86	LOCKOUT RELAY (HAND RESET)
OSR	OIL SURGE RELAY
PRV	PRESSURE RELEASE VALVE
50BF	BREAKER FAIL
46	REVERSE PHASE/UNBALANCE
24	VOLTS PER HERTZ RELAY
49	TRANSFORMER THERMAL RELAY
64R	RESTRICTED EARTH FAULT PROTECTION RELAY

- 3-PH DISTRIBUTION TRANSFORMER
- CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- CABLE TERMINATION
- 415V DRAW OUT TYPE AIR CIRCUIT BREAKER
- 11kV DRAW OUT TYPE VACUUM CIRCUIT BREAKER
- 415V MOULDED CASE CIRCUIT BREAKER
- 415V MINIATURE CIRCUIT BREAKER
- BREAKER CONTROL SWITCH
- INDICATING LAMP
- M MOTOR
- STAR-DELTA STARTERS WITH SINGLE PHASE PREVENTOR AND MPR
- DIRECT ONLINE STARTERS WITH SINGLE PHASE PREVENTOR AND MPR
- G DG SET WITH AMF CONTROL PANEL
- TCH TRIP CIRCUIT HEALTHY INDICATION (WHITE LED)
- SCI SPRING CHARGED INDICATION (BLUE LED)
- BON BREAKER ON INDICATION (RED LED)
- BOFF BREAKER OFF INDICATION (GREEN LED)
- TRIPPED ON FAULT INDICATION (AMBER LED)
- DCF DC SUPPLY FAIL INDICATION (AMBER LED)
- BS BREAKER IN SERVICE POSITION (RED LED)
- BT BREAKER IN TEST POSITION (CLEAR LED)
- ACF AC SUPPLY FAIL INDICATION (AMBER LED)
- ON ON INDICATION (RED LED)
- OFF OFF INDICATION (GREEN LED)
- TRIP TRIP INDICATION (AMBER LED)
- R R-PHASE INDICATION LAMP (RED LED)
- Y Y-PHASE INDICATION LAMP (YELLOW LED)
- B B-PHASE INDICATION LAMP (BLUE LED)
- L/R LOCAL/OFF/REMOTE SELECTOR SWITCH
- SA SURGE ARRESTER
- ASS+DA DIGITAL AMMETER WITH BUILT IN SELECTOR SWITCH
- VSS+DV DIGITAL VOLTMETER WITH BUILT IN SELECTOR SWITCH
- 415V, FIXED TYPE MOTOR PROTECTION CIRCUIT BREAKER (MPCB)
- ICP INSTRUMENTATION CONTROL PANEL
- N.RELAY NUMERICAL RELAY
- MFM MULTI FUNCTION METER WITH RS485 COMMUNICATION (AMMETER, VOLTMETER, PF, FREQUENCY)
- PLC PROGRAMMABEL LOGIC CONTROLLER
- MPR COMPREHENSIVE MOTOR PROTECTION RELAY
- M METERING UNIT
- CAPACITOR BANK
- LCSP LOCAL CONTROL STARTER PANEL
- TTB(CT SHORT LINK)
- SS SOFT STARTER
- ISO LOCAL ISOLATOR SWITCH
- RC READY TO CLOSE (CLEAR LED)
- LCP LOCAL CONTROL PANEL
- TR CONTROL TRANSFORMER
- I/L INTER LOCK

INTERLOCK:

INCOMER-1	INCOMER-2	BUS COUPLER	DG
ON	ON	OFF	OFF
ON	OFF	ON	OFF
OFF	OFF	ON	ON
OFF	ON	ON	OFF

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CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 20 MLD CAPACITY STP AT KADUGODI

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 02 OF 05

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SCALE : NTS | DC & DISC : BLR-EL | DWG NO. TCE.13052A-EL-4001-AU-40032 | ISSUE P0 | SIZE-A1

FILE NAME: F-091-Rev-R1.dwg

TCE FORM NO. 091 R1

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 20MLD STP, KADUGODI

DWG NO TCE.13052A-EL-4000-AU-40033

NOTES:-

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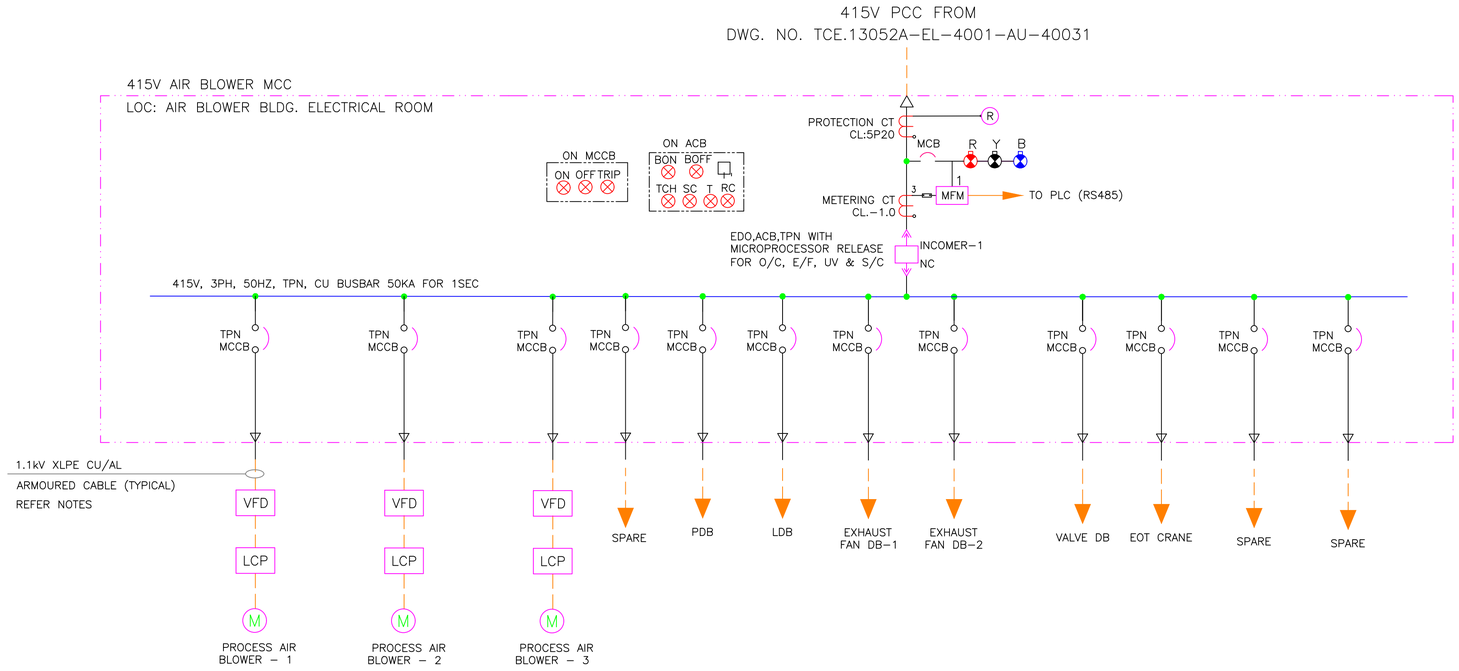

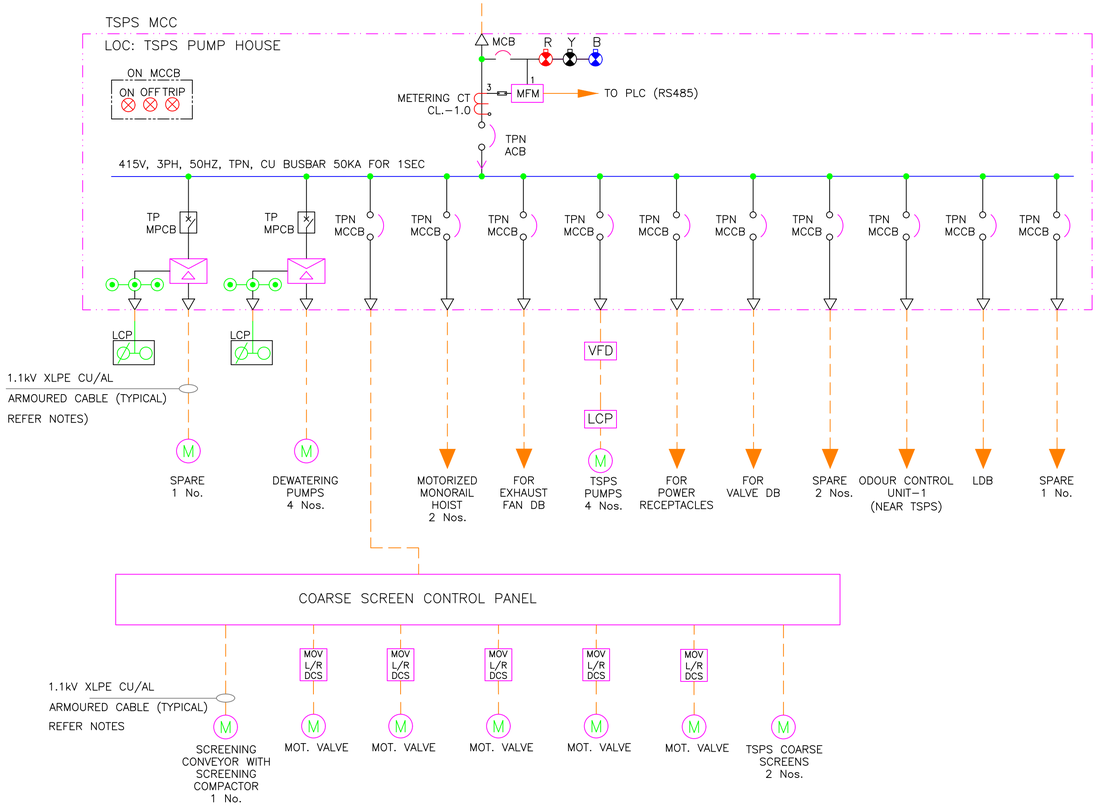

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CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 20 MLD CAPACITY STP AT KADUGODI

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 03 OF 05

TATA CONSULTING ENGINEERS LIMITED
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SCALE : NTS | DWG NO. TCE.13052A-EL-4000-AU-40033 | ISSUE P0

DC & DISC: BLR-EL

SIZE-A1

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FILE NAME: F-091-Rev-R1.dwg

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 20MLD STP, KADUGODI

DWG NO TCE.13052A-EL-4000-AU-40034

NOTES:-

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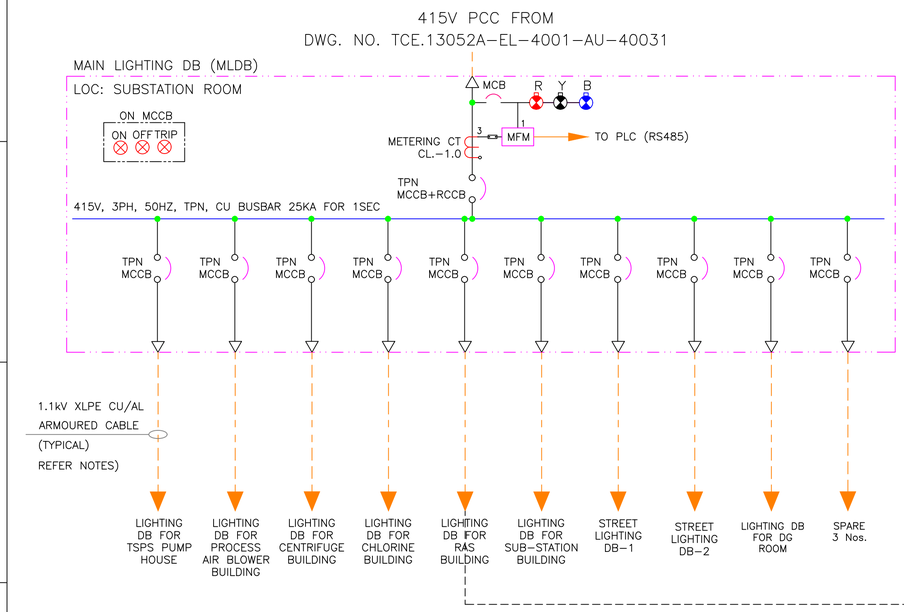

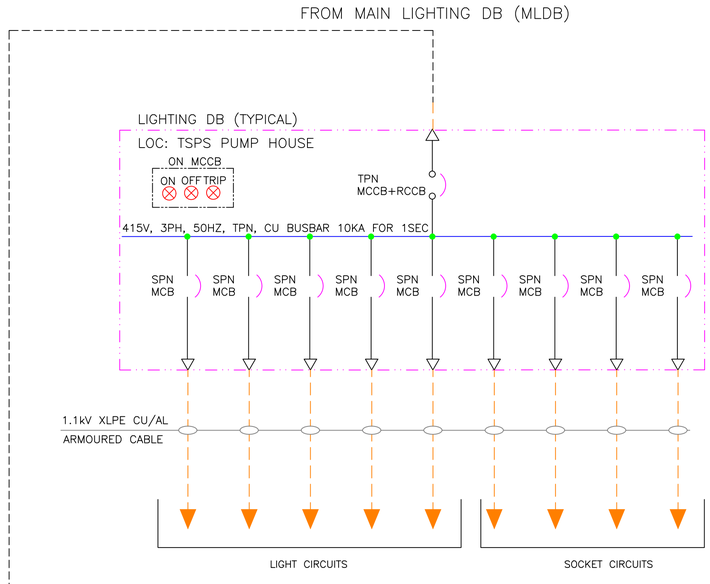

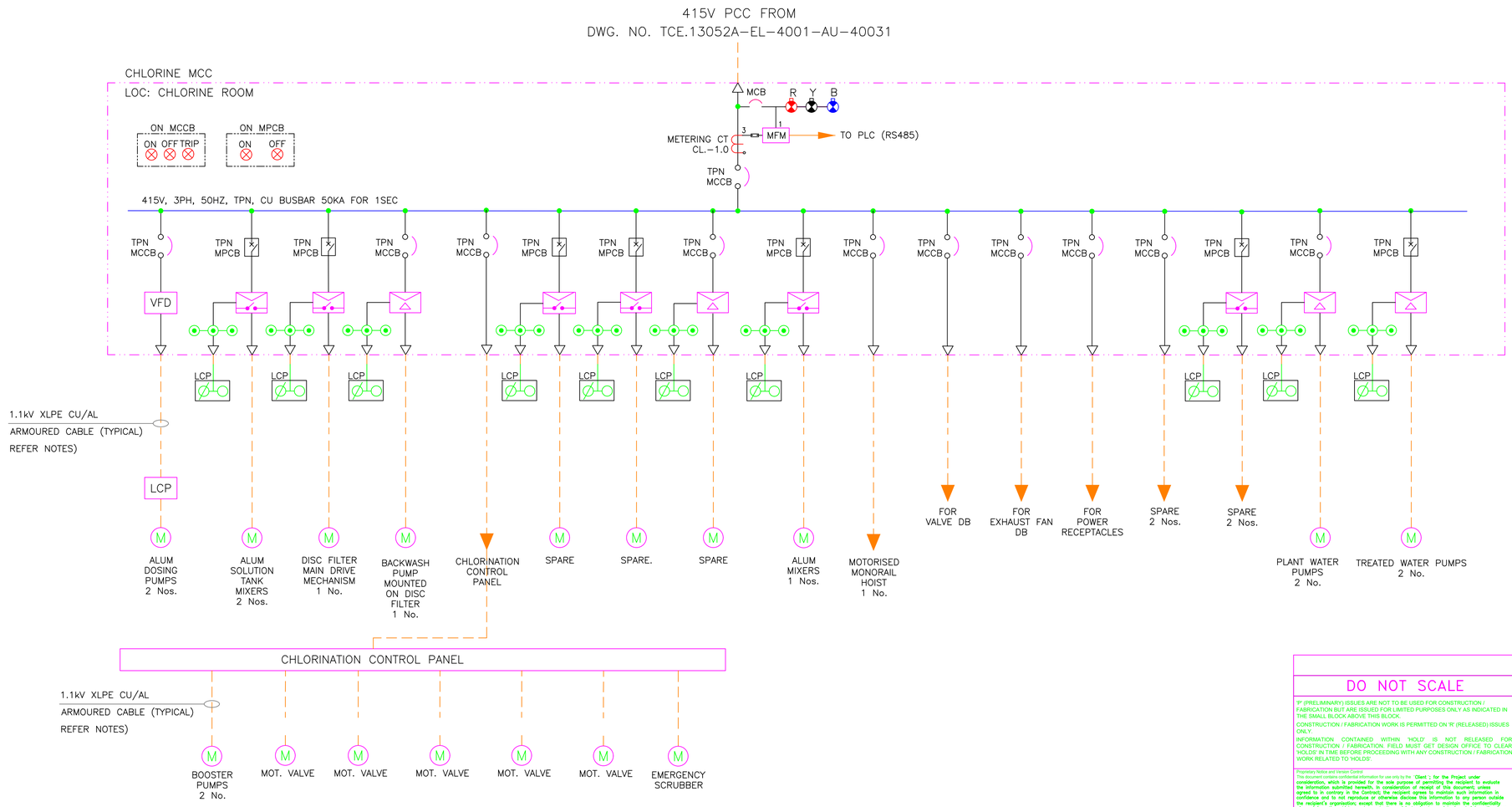

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FILE NAME : SLD (20 MLD Kadugodi).dwg

TATA CONSULTING ENGINEERS LIMITED
MUMBAI

SCALE	DWG NO.	ISSUE
: NTS	TCE.13052A-EL-4000-AU-40034	P0
DC & DISC: BLR-EL		

SIZE-A1

TCE FORM NO. 091 R1

FILE NAME: F-091-Rev-R1.dwg

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 20MLD STP, KADUGODI

DWG NO: TCE.13052A-EL-4000-AU-40035

NOTES:-

1. FOR GENERAL NOTES, LEGENDS, REFER DRAWING NO. TCE.13052A-EL-4001-AU-40031.

415V PCC FROM DWG. NO. TCE.13052A-EL-4001-AU-40031

HEADWORKS MCC

LOC: SUBSTATION BUILDING

ON MCCB: ON OFF TRIP

ON MPCB: ON OFF

MCB R Y B

METERING CT CL.-1.0 — 3 — 1 MFM → TO PLC (RS485)

TPN MCCB

415V, 3PH, 50HZ, TPN, CU BUSBAR 50KA FOR 1SEC

TPN MCCB | TPN MPCB | TPN MPCB | TPN MPCB | TPN MPCB | TPN MCCB | DP MCB | DP MCB | TPN MCCB | TPN MCCB | TPN MCCB | TPN MPCB | TPN MCCB | TPN MCCB

LCP | LCP | LCP | LCP | LCP

- FINE SCREEN PANEL
- GRIT MECHANISM DRIVE 2 Nos.
- GRIT TRANSFER PUMP 2 Nos.
- GRIT WASHER MECHANISM 2 Nos.
- GRIT DISCHARGE CONVEYOR 2 Nos.
- SPARE
- FOR AIR CONDITIONING IN SCADA, CONTROL ROOM BUILDING – 2NOs.
- FOR AIR CONDITIONING IN CONFERENCE HALL, ENGINEERS ROOM – 2NOs.
- FOR EXHAUST FAN DB IN SUB-STATION BUILDING
- FOR POWER RECEPTACLES
- FOR VALVE DB
- SPARE 2 Nos.
- SPARE 2 Nos.
- ODOUR CONTROL UNIT-2 (NEAR HEAD WORKS)

1.1kV XLPE CU/AL ARMOURED CABLE (TYPICAL) REFER NOTES)

FINE SCREEN CONTROL PANEL

1.1kV XLPE CU/AL ARMOURED CABLE (TYPICAL) REFER NOTES)

- SCREENING CONVEYOR WITH SCREENING COMPACTOR 1 No.
- MOV L/R DCS → MOT. VALVE
- MOV L/R DCS → MOT. VALVE
- MOV L/R DCS → MOT. VALVE
- MOV L/R DCS → MOT. VALVE
- MOV L/R DCS → MOT. VALVE
- FINE SCREENS 2 Nos. – 3 KW

415V PCC FROM DWG. NO. TCE.13052A-EL-4001-AU-40031

RAS MCC

LOC: SUBSTATION BUILDING

ON MCCB: ON OFF TRIP

ON MPCB: ON OFF

MCB R Y B

METERING CT CL.-1.0 — 3 — 1 MFM → TO PLC (RS485)

TPN MCCB

415V, 3PH, 50HZ, TPN, CU BUSBAR 50KA FOR 1SEC

TPN MPCB | TPN MPCB | TPN MPCB | TPN MCCB | TPN MPCB | TPN MCCB | TPN MCCB | TPN MCCB | TPN MCCB | TPN MCCB | TPN MCCB | TPN MCCB | TPN MCCB

VFD | VFD | LCP | LCP

LCP | LCP | LCP | LCP

1.1kV XLPE CU/AL ARMOURED CABLE (TYPICAL) REFER NOTES)

- ANAEROBIC MIXERS 3 NOS.
- ANOXIC MIXERS 7 Nos.
- DE-AERATION MIXERS 2 Nos.
- MLR PUMPS 4 Nos.
- SECONDARY CLARIFIERS 2 Nos.
- RAS PUMPS 3 Nos.
- EOT CRANE (SECONDARY PH)-1 No.
- EOT (IFAS TANK) 1 NO.
- SPARE 4 No.
- FOR EXHAUST FAN DB
- FOR POWER RECEPTACLES
- FOR VALVE DB

415V PCC FROM DWG. NO. TCE.13052A-EL-4001-AU-40031

CENTRIFUGE MCC

LOC: CENTRIFUGE BUILDING

ON MCCB: ON OFF TRIP

ON MPCB: ON OFF

MCB R Y B

METERING CT CL.-1.0 — 3 — 1 MFM → TO PLC (RS485)

TPN MCCB

415V, 3PH, 50HZ, TPN, CU BUSBAR 50KA FOR 1SEC

TPN MPCB | TPN MCCB | TPN MCCB | TPN MPCB | TPN MCCB | TPN MPCB | TPN MPCB | TPN MCCB | TPN MCCB | TPN MCCB | TPN MCCB | TPN MCCB | TPN MCCB | TPN MCCB | TPN MCCB | TPN MPCB | TPN MCCB

VFD | VFD | LCP | LCP | LCP | LCP | LCP | LCP | LCP | LCP | LCP

1.1kV XLPE CU/AL ARMOURED CABLE (TYPICAL) REFER NOTES)

- SCUM TRANSFER PUMPS 2 Nos.
- SPARE 2 NOS.
- PLANT DRAIN PUMPS 2 Nos.
- CENTRIFUGE FEED SUMP MIXER 2 No.
- POLYMER SYSTEM 3 Nos.
- DEWATERED SLUDGE CONVEYOR 1 No.
- SPARE 1 No.
- POLYMER DOSING PUMPS 3 Nos.
- CENTRIFUGE FEED PUMPS 3 Nos.
- ODOUR CONTROL UNIT-3
- CENTRIFUGE CONTROL PANEL 3 NOS.
- EOT CRANE 1 No. SLUDGE THICKENED BLDG.
- EOT CRANE 1 No. CENTRIFUGE FEED PH
- FOR EXHAUST FAN DB – 3 NOS (CHMEICAL BLDG, CENTRIFUGE BLDG, CENTRIFUGE FEED PH).
- FOR POWER RECEPTACLES
- FOR VALVE DB
- SPARE 2 Nos.
- SPARE 2 Nos.

FOR TENDER PURPOSE ONLY

	SIGN.											
	INITIALS											
	REVISIONS											
	SIGN.											
	INITIALS											
	REVISIONS											
PO	SIGN.											
	INITIALS											
ISSUE		DRN	DSN	CHD	CV	EL	IC	ME	CLEARED	PE/PM	APPD	DATE

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FILE NAME : SLD (20 MLD Kadugodi).dwg

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 20 MLD CAPACITY STP AT KADUGODI

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 05 OF 05

TATA CONSULTING ENGINEERS LIMITED
MUMBAI

SCALE : NTS	DWG NO. TCE.13052A-EL-4000-AU-40035	ISSUE P0
DC & DISC: BLR-EL		SIZE-A1

FILE NAME: F-091-Rev-R1.dwg

TCE FORM NO. 091 R1